

DOCUMENT RESUME

ED 177 674

EA 012 159

AUTHOR Cohen, Elizabeth G.; Miller, Russell M.
TITLE Increased Accountability and the Organization of Schools.
INSTITUTION Stanford Univ., Calif. Inst. for Research on Educational Finance and Governance.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.
REPORT NO CERAS-79-A2
PUB DATE May 79
CONTRACT NE-C-00-3-0062
GRANT NIE-G-78-0212
NOTE 44p.

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Administrator Role; Coordination; Decision Making; Early Childhood Education; Educational Accountability; Elementary Schools; Elementary Secondary Education; Leadership; *Organizational Communication; Organizational Theories; *Power Structure; Principals; *School Organization; Supervision; *Teacher Administrator Relationship

IDENTIFIERS Early Childhood Education Program CA; Task Uncertainty

ABSTRACT

This study examines how much organizational theories can be applied to understanding schools. According to one organizational theory, certain pressures can force an organization to use more sophisticated methods of coordination. In a school, this would mean that staff and parents would be forced to work together to find ways to deal with uncertainty. Some previous research, however, suggests that schools are quite unlike other organizations; they have weak hierarchical controls of instruction and few coordinating mechanisms. This analysis examines how California's Early Childhood Education (ECE) Program affected coordination and control in participating schools. Data used were collected by the Environment for Teaching Program at Stanford University. Results suggest that the pressures created by the ECE program did indeed force the schools to use new types of coordination (horizontal communication through ad hoc committees) and that in ECE schools, even more than other schools, weak coordination and control are associated with a school's failure to be effective in making decisions. (Author/JH)

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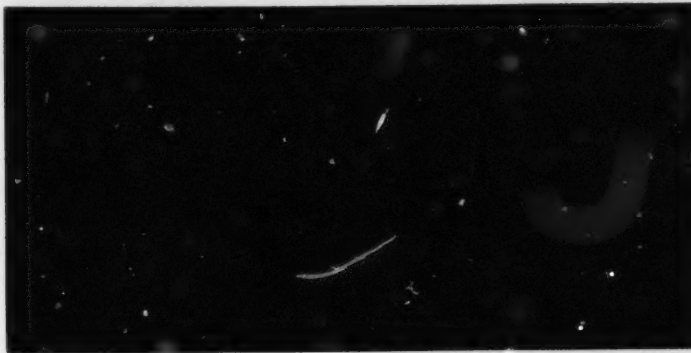
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SCHOOL OF EDUCATION STANFORD UNIVERSITY



Project Report No. 79-A2

INCREASED ACCOUNTABILITY AND THE
ORGANIZATION OF SCHOOLS

Elizabeth G. Cohen and Russell H. Miller^{*}

May 1979

^{*}The authors are, respectively, Professor of Education and Sociology, Stanford University, and Doctoral Candidate, Department of Sociology, Stanford University.

The research for this project was supported in part by the National Institute of Education (Grant Nos. NE-C-00-3-0062 and NIE-G-78-0212). The analysis and conclusions do not necessarily reflect the views or policies of this organization or the Institute for Research on Educational Finance and Governance.

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INCREASED ACCOUNTABILITY AND THE ORGANIZATION OF SCHOOLS

Abstract

In this analysis, we examine how California's Early Childhood Education Program created a complex environment for participating schools: their tasks became much more uncertain; and they became strictly accountable to the state for the implementation of their program and for the achievement of instructional goals. According to the literature on organizations, such pressures should force the school to use different and more sophisticated methods of coordination. The staff and the parents should be forced to work together to find ways to deal with uncertainty.

But previous studies suggest that schools are quite unlike other organizations; they have weak hierarchical controls of instruction and few coordinating mechanisms. Using a body of data collected by the Environment for Teaching Program at Stanford University, we examine how useful propositions based on the study of other organizations are to an understanding of schools. Does the ECE program represent the kind of conditions that force schools to look more like other organizations? We find support for these claims: (1) ECE schools in the sample are more likely to use coordination requiring horizontal communication (ad hoc committees) than other elementary schools; (2) overall, weak coordination and control in all schools is associated with a school's failure to be effective in making decisions; this relationship holds more strongly for ECE schools than for other schools.

Organizational theorists argue that when an organization faces environmental and internal complexity, it must respond with adequate coordination, or it will suffer the consequences of ineffective performance (Galbraith, 1967:19). For example, Thompson states that "coordination is a central problem for the technical core of the organization, adjustment to constraint and contingencies not controlled by the organization is the crucial problem for boundary-spanning components." (1967:81).

But what happens when environmental and internal complexities are thrust upon a simple organization typically lacking in strong hierarchical control and showing few sophisticated coordination mechanisms? In this paper we explore such a situation: the complexity created for schools by their participation in California's Early Childhood Education Program. We analyze the need for more sophisticated internal coordination mechanisms in participating schools. These are necessary to handle the change in technology of teaching, staff differentiation, and the complicated process of decision-making mandated by the state. In addition we analyze the need for increased organizational control of instruction in the face of stringent accountability to the state.

Turning to a body of data taken from a survey of schools in the San Francisco Bay Area, we compare ECE schools with other schools to see if they show coordination and control mechanisms appropriate for the greater uncertainty and more demanding environment they face. We also test the proposition that failure to use appropriate coordination and control strategies in the ECE schools will be closely associated with the school's failure to make decisions effectively. That is, the costs of weak coordination and control should be much higher in these schools than in typical elementary schools.

WHAT IS ECE?

The Early Childhood Education Program was a California plan to improve instruction in Grades K-3; it was in operation between 1973 and 1977. The state gave money directly to those elementary schools submitting an acceptable program for improving instruction. Programs for improvement typically stressed individualized instruction, especially in the area of reading. The money was often used for buying individualized curriculum materials and for hiring of teaching aides, specialists and resource teachers who could assist with the program of individualization.

The State Department of Education required a complicated planning process before funding the plan for improvement. A separate plan had to be drawn up for each grade. The school had to conduct a needs assessment and was required to involve parents and teachers in making decisions about school priorities. Also required was a school site council with parents and teachers; this council had formal rights to make decisions about the use of state moneys.

Most unusual in the recent history of school finance, was the strict accountability demanded by the state authorities for these funds. A state team came regularly to inspect ECE schools and classrooms; schools were rated on the implementation of their own plan and on their success in meeting instructional objectives. If a school received consistently unsatisfactory ratings, the plans would not be funded. This kind of detailed inspection of instruction may well represent a wave of the future as pressures for accountability in education continue to grow.

Teachers and principals in ECE schools suddenly had many new, complex problems to solve; however, they were essentially without guidance regarding

possible solutions. The shift toward individualization brought about the use of highly differentiated materials and student grouping in the classroom. Subjects such as reading and mathematics were broken into many specific skills; teachers tried to give each child appropriate materials so that he or she would master as many of these skills as possible. Systematic application of this approach required teachers to use the same philosophy of instruction and to coordinate records of student progress; each child had a cumulative file showing which of dozens of skills he or she had mastered.¹

The introduction of aides, specialists, resource teachers and parent volunteers changed everyone's role; all these roles had to be coordinated. The principal was ultimately responsible for this coordination. In addition, if a school were to be prepared to meet state inspection, the principal would presumably have to know how well the staff was doing and would have to take steps to insure implementation of the school's plan.

The process of making group decisions required by the state was a difficult and puzzling new task for the school. As one principal described the problems: "I wasn't trained. I really had very little experience and the staff had very little experience and the parents had very little experience in working together."

COORDINATION IN RESPONSE TO COMPLEXITY

If we could assume that these elementary schools were like other organizations, we would expect to find that ECE schools, faced with such complexity, paying increased attention to problems of coordination. Especially important should be increased communication; the people who work together might want to pool information in an attempt to solve their problems as a group.

However, it is not clear that schools are sufficiently similar to other organizations for increased coordination to be found as a response to increased complexity. In the sections below, we consider this in relation to the relevant claims of organizational literature.

Responses to Task Uncertainty

To make intelligent decisions and to take well-informed actions, the school participating in the ECE program had a much greater need for information than traditional schools. It required feedback on the success of its internal activities to be sure it was meeting goals set by the program. When failures and problems arose, the staff had to be capable of making corrective actions and adjustments. For example, if large numbers of children were not attaining instructional objectives or if teachers were failing to keep the detailed records required by the plan (and the state), something had to be done before the state inspection occurred. In addition, the school had to monitor frequent changes in demands and directives coming from program administration at the state level and to change staff behavior accordingly.

This situation clearly corresponds to what organizational theorists call "task uncertainty." Galbraith defines uncertainty "as the difference between the amount of information required to perform the task and the amount of information already possessed by the organization." (1973:4-5). Galbraith among others discusses the necessity of special coordination strategies in order to meet the increased needs for information processing in an uncertain task environment.

Van de Ven and colleagues, in a systematic empirical study, examined the pattern of coordination in organizations facing increased task uncertainty. Positively associated with task uncertainty was more coordination involving

mutual adjustment as compared to coordination through hierarchical control or rules and plans.

. . . mutual work adjustments through horizontal communication channels and group meetings . . . used in lieu of coordination through hierarchy and impersonal programming. (1976:332)

Similarly, March and Simon stress that coordination by feedback is an effective response to uncertainty:

The more stable and predictable the situation, the greater the reliance on coordination by plan; the more variable and unpredictable the situation, the greater the reliance on coordination by feedback. (1958:160)

However, March and Simon find that coordination by feedback is very demanding on the organization, because of its burden on communication.

The need for more formal and informal meetings in the ECE schools was an obvious consequence of the program. Just to list a few of the reasons for meetings and increased interaction: teachers had to learn how to work with aides; parent volunteers had to be incorporated and made to feel significant and useful; teachers in the affected grades had to coordinate their record keeping and direct their teaching and testing program to the same instructional objectives; coincidental with the implementation of the plan in Grade 1, there was a mandated state-funded planning process with parents and teachers for Grade 2. Principals had to deal with sticky problems of the jealousy of teachers in Grades 4-6 who did not stand to benefit directly from the program funds; he or she also had to work with informal leaders in the faculty who could either sabotage the whole effort or make it successful. Principals fought rear guard actions at the district level to prevent the district from

trying to use program funds to pay for budgetary items ordinarily paid for by the central office.

Responses to Accountability Pressures

The responsibility of the principal was greatly increased in the ECE school. Although the teachers and parents were required to do a needs assessment to decide on priorities for the school, in the last analysis the principal was responsible for submitting the plan and the budget under considerable time constraint. It was the principal who had to set the planning process into motion and to see to it that some usable product resulted.

In the implementation phase there was a whole series of formally constituted decision-making groups (School Site Council, teacher groups and ad hoc task forces). Yet the principal was the central figure of accountability in the face of external evaluation. Somehow the dilemma of a democratic decision making process and technically effective decisions capable of producing desired instructional outcomes had to be resolved.

The principal was ultimately responsible for the solution of the technical problems of individualized instruction. If sufficiently expert, the principal might assist teachers with supportive advice or the principal could delegate this role to a specialist or resource teacher. This is precisely the kind of supervision the organizational literature describes as necessary when professionals cope with highly uncertain tasks (Ritchie, 1976:67).

Ouchi observes that there are usually a greater proportion of superiors to subordinates where professionals work; they are necessary for coordination and information processing, rather than restrictive supervision, because professionals make greater demands on their superiors for information and advice, having to deal with more complex and uncertain tasks (1976:113).

Application of this reasoning to the ECE school clearly leads us to expect the ECE principal to play an important role in the area of instruction. Because they are responsible for the solution to technical problems, they should be more likely to coordinate the staff for the purpose of solving problems and should be more concerned with provision of helpful supervision for the teachers.

Coordination and Decision-Making

If a complex organization fails to develop necessary coordination to solve its problems, one can infer from the organizational literature that such irrationality is costly. As Galbraith points out:

. . . if the organization is faced with a greater uncertainty, due to technological change, higher performance standards, increased competition. . . the amount of information processing is increased. (1973:19)

Galbraith suggests four strategies the organization may adopt to deal with such complexity. While he points out that one means of responding to such uncertainty is to reduce the need for coordination by creating autonomous units (and this is typically how schools have operated) this response is precisely what the ECE program precludes. He goes on to state: "If it does not consciously choose one of the four, then the first, reduced performance standards, will happen automatically." (1973:19)

Galbraith's arguments should apply to the ECE school. If coordination mechanisms do not operate, information will not be gathered for the solution of problems. We should then see the school floundering in making and/or implementing decisions on technology, staffing, and its interactions with parents and state officials. The connection between coordination and

and effective decision-making should be much clearer in ECE schools, partly because the making of decisions is a much more formal and public procedure due to the requirements of the State Department of Education's demands for school accountability.

Unless schools have parent councils mandated by other special programs such as Title I, it is often the case that teachers make the decisions about curriculum as individuals; the principals make the rest of those decisions not constrained by budget, district or state regulations. In schools studied by the Environment for Teaching, it is common for teachers to agree that there are no policies on important matters like instruction and evaluation.

In review, we are arguing that the cost of weak coordination should be much greater for the ECE school than for other schools. They face much more task uncertainty; their faculty need more informed and helpful supervision; and they are compelled to carry out a complex group decision-making process. Specifically, we would predict that the extent of coordination will be associated with the effectiveness of decision-making in an ECE school. This relationship will not necessarily hold in other schools.

Schools as a Limiting Case for Organizational Theory

There are several problems in applying the thinking of organizational theorists to the elementary school. The discussion of more sophisticated mechanisms of coordination assumes that the schools are at minimum being coordinated by rules, plans and by simple hierarchical control, and that they deal with internal activities and environmental surveillance through these mechanisms.

However, the instructional activity of schools does not seem to be very tightly controlled by anyone beyond the classroom teacher. Internal coordi-

nation efforts on a school-wide basis have traditionally been weak or non-existent. Typically, classroom teachers and school leaders function as autonomous units. Teaching is infrequently and weakly evaluated (Lortie, 1969; Dornbusch and Scott, 1975). Administration typically does not control or develop instructional practices (Deal, Meyer and Scott, 1975). Educational administration literature advocates a kind of "climate leadership" maximizing informal, face-to-face interactions, which are typically reinforcing.

Traditionally, schools have not been forced to modify their activities to meet environmental demands. The boundary-spanning activities of schools have been concerned with superficial compliance with environmental demands. Indeed, schools often purposely eliminate organizational accounting of outcomes. Meyer and Rowan (1977) argue that schools are funded and supported to the degree that they conform to institutionalized norms and achieve socially mandated goals; the efficiency and quality of their activities is not under close environmental inspection. Since such accounting is not sought by environmental actors, it is preferable for schools to avoid close inspection of outcomes in order to protect institutionalized faith in the school's legitimacy (Deal, et al., 1976).

Thus schools can be described as "loosely coupled" organizations with respect to instructional outcomes. If this is true, applying propositions on task uncertainty and organizational coordination to schools is questionable. Put very simply, if the principal does not really control instruction through any formal process of evaluation, how can he or she be made accountable by rigorous outside pressure and inspection? It is quite possible that principals simply don't have sufficient sanctions at their command to request or enforce compliance, no matter how strongly the policy makers wish to hold them to account. Additionally, one wonders whether ECE schools can

respond to increased task uncertainty with more sophisticated coordination techniques if they have not developed the simpler more impersonal techniques such as policies and standardization.

The organizational literature is not very helpful; it doesn't tell us under what conditions the propositions concerning coordination as a response to task uncertainty hold. Some kind of minimal organizational integration seems implied; and it could be that schools do not now and will never meet those conditions.

ECE Vs. Other Schools: DATA ANALYSIS

We have extensive data from a survey of San Francisco Bay Area elementary schools in 1973 and again in 1975 (Cohen, Deal, Meyer & Scott, 1979). The design of the survey was longitudinal with a random sample of schools and school districts. Relevant data are from 31 schools where principals and teachers were studied in 1975; these schools are not a random sample, but a selection on the basis of 1973 results from principal interviews. They represent a wide range of staffing patterns and include both urban and suburban schools.

Of these 31 schools, 13 were participating in the ECE program. ECE schools in the sample are rather large and show a wide range of socio-economic status in the student body.

Predictions

We expect to find increased coordination in ECE schools because of increased uncertainty and increased pressure for accountability; the staff should be more likely to work with each other to process information and solve problems. We should be seeing more of what Van de Ven et al. call "mutual work adjustments" and "horizontal communication" in these schools (1976:332). The above analysis of the ECE model suggests that a straight-

forward application of the organizational literature makes good sense.

Furthermore, if principals in ECE schools do not use some kind of coordination and control strategies, the decision-making process should suffer. If there are not standardized ways of making decisions with school-wide policies, or if there is little attempt to bring people together to solve problems, then it is difficult to see how a school could meet the requirements of the program. "Muddling through" in the way we see many schools operate, should be quite costly under these special conditions. Therefore we predict that teachers in ECE schools with weaker coordination and control will be more likely to report ineffective decision-making as compared to ECE schools with stronger coordination and control.

In other schools lack of coordination should not be as costly; decision-making is less important, less visible, and therefore less likely to even be evaluated by the teachers. Therefore we predict a much weaker relationship between coordination and effectiveness of decision-making in non-ECE schools.

We have been using the words "coordination and control" as if they were one and the same. Actually, looking at the role of the principal, it is useful to analyze the concept of control separately from that of coordination. Coordination is one sub-set of activities of the person who is in a position of authority. Coordination refers to arrangement of time, space, personnel and resources so as to attain the goals of the organization. These duties can be separated from the principal's formal right to evaluate the teachers and to direct teachers in the work of instruction. Although this is the way authority figures operate in other organizations, such direct and hierarchical control of activities is infrequent in schools; it

is not clear that principals compel compliance either through formal evaluation or through directing the activities of teachers.

The principal does have major responsibility for success of the ECE program. However, it is possible that he or she obtains compliance from the staff in ways never contemplated by the organizational theories we have cited. Previous research suggests we should not assume that principals who coordinate the staff to meet the requirements of ECE do so through simple hierarchical control. Nor will we assume that ECE principals are more likely to use simple methods of coordination such as policies.

Instead, we will simply compare the two sets of schools on use of policies and on two measures of principal influence. In testing the second prediction we can examine the power of several coordination and control strategies to predict a measure of decision-making effectiveness.

In review, we are making two specific predictions:

1. ECE schools will use more coordination by mutual adjustment featuring horizontal communication than will non-ECE schools.
2. Failure to coordinate will be more strongly related to ineffectiveness in decision-making in ECE schools than in other schools.

Measures

Because this was a secondary analysis, we did not have ideal questionnaire items for the measurement of all the coordination strategies discussed in the literature; nor did we have a variety of measures of organizational effectiveness for the dependent variable. However, we were able to construct several indices with high inter-item correlations and several Guttman scales.

COORDINATION: POLICIES. Of the various methods of impersonal coordination (programming, schedules, forecasts, formalized rules, policies,

procedures, standardized information and communication systems) we have an index of the use of school-wide policies. Teachers were asked to what extent there were generally understood policies on a number of different classroom and school-wide tasks: Student conduct on grounds, reporting student progress, student absences, care of needy students and student evaluation criteria. The inter-item correlation coefficients of this index were all in an acceptable range of .19 to .30 except for one correlation of .09. The item-scale correlation coefficients were all in an acceptable range of .56 to .65.

Because the school is the unit of analysis, it is necessary to aggregate these teacher reports to a school level. Before calculating a mean of teacher score on the Policies Index for each school, we performed an analysis of variance to see if there were less variance on the index within schools than between schools. Results showed that teachers in the same school tended to agree with each other in their perceptions of general policies at their school (F value of 2.74, with significance at $p < .001$).

COORDINATION: AD HOC COMMITTEES. An index of the use of ad hoc committees in the school served as a measure of horizontal communications and mutual adjustment. Principals reported on their use of committees to solve instructional, school-community, and administrative problems. The four items show a strong pattern of intercorrelation and very strong item-to-scale relationships (For more information, see appendix). Evidently, some principals use this strategy to deal with a wide range of problems.

CONTROL: PRINCIPAL SUPERVISION. A four-item Guttman scale, Principal Report of Principal Supervision, is the measure of simple hierarchical control. This scale was constructed on the total sample of 89 principals studied in 1975. The items represent a dimension of supervision from discussing a

teacher's work up through formal evaluations of teachers; the principal reports on the frequency of these supervisory activities. The easiest item merely inquires about the frequency of a principal's discussion of the teacher's work; 78% of the principals gave the passing response of "About once a month" or more frequently. In contrast only 22% of the principals reported that they evaluated reading teachers frequently, the most difficult item to pass.

The Principal Supervision scale has a reproducibility coefficient of .92; this informs us that those principals who report frequent evaluation also use discussion and advice as methods of influencing teachers. Of the 89 principals, only 14% receive the highest score; the typical scale score is "two." Principals with this score use discussion and advice but infrequently use formal evaluation of reading programs and reading teachers (See appendix for details). The fact that this is the typical score suggests the weakness of the formal sanctions a principal can use.

CONTROL: PRINCIPAL SUPPORT. A four-item Guttman scale, Teacher Report of Principal Support, is a measure of a more supportive, informal, face-to-face relationship of the principal with the teacher. Because principals have so few formal sanctions, they appear to influence teachers through use of warmth, praise and offerings of resources. This behavior is similar to the concept of "climate leadership" advocated for school administrators. This is an alternative version of the leadership role we find in the atypical organization of most schools.

This scale has a reproducibility coefficient of .95; the items represent a dimension running from praise to providing actual resources and working closely with the teacher on instruction. The pattern of items forming this

scale is informative; those teachers who report that the principal works closely with them on instruction, also report that he or she does so in a reinforcing and positive context. This interrelationship suggests that those principals who have the highest score, influence teachers through close interpersonal positive communication. This is hardly a picture of a typical bureaucratic authority figure directing employees. Relatively few teachers (21%) report principals working closely with them on instruction; many more (74%) report principals who occasionally praise their work. (See appendix for more details.)

DEPENDENT VARIABLE: DECISION-MAKING EFFECTIVENESS. As one possible measure of organizational effectiveness, we created a scale measuring effectiveness of the decision-making process as reported by teachers. We assumed that teachers are good informants on the way decisions are made and implemented in the school as a whole. If teachers in a given school are in agreement in reporting that there is a lack of clarity in problem definition, poor efforts at implementation, and a lack of systematic evaluation of the effects of decisions taken, we infer that there are organizational problems which an objective outside observer would also see.

The Guttman scale of Decision-Making Effectiveness was made up of four items adapted from Schmuck and Runkel (1970; 26-28); the coefficient of reproducibility is .94. In order to check on teacher agreement, we again ran an analysis of variance which showed more teacher consensus within schools than between schools (F value of 1.96, with significance at $p < .01$). The average score for this scale was calculated for each school. (See appendix for more on this scale).

Strategy of Analysis

We divide the sample into ECE and non-ECE schools. To test the first prediction, we simply examine the distribution of scores for the two sets of schools on the four measures of coordination and control.

In order to test the second prediction, we correlate measures of coordination and control with the dependent variable of decision-making effectiveness. If the second prediction is correct, the correlations for ECE schools should be stronger than the correlations for non-ECE schools. In addition to simple correlation coefficients, we examine the power of simple hierarchical control and coordination to account for variance in the Decision-Making Effectiveness Scale, our measure of climate leadership. Coordination and simple hierarchical control should, according to the prediction, add substantially to the prediction of decision-making effectiveness in ECE schools.

RESULTS

Cross-Tabulations

Table 1 presents distributions of the coordination and control variables for ECE and non-ECE schools. In general, comparison indicates that ECE schools and principals are receiving higher scores on the two measures of coordination but somewhat lower scores on the two measures of principal influence and control.

Table 1 about here

The ECE schools do seem to use both simple and complex methods of coordination somewhat more than other schools. Specifically, ECE principals are more likely to receive high scores on the index of Ad Hoc Committees.

Also, teachers in ECE schools are more likely to report school-wide policies over a variety of areas.

Examination of differences on the Principal Supervision Scale shows that no ECE principal receives the highest score (evaluates both teachers and reading programs frequently), while 3 of the non-ECE principals receive this score. Even though the distributions are not dissimilar from a purely statistical point of view, it is interesting that we have no ECE principals reporting frequent evaluations of reading teachers. Evidently ECE schools are no more likely to use simple, formal hierarchical control than other schools. Also interesting are the differences in the distribution of Principal Supportiveness scale scores (teacher report). On this measure of climate leadership only four ECE schools receive the highest mean value of the scale (3-4.5) while 18 non-ECE schools fall in this range of mean values.

Correlations

Table 2 contrasts the patterns of intercorrelations of measures of coordination, control and decision-making effectiveness for the two sets of schools. The top part of the table compares relationships of predictor variables to the dependent variable of decision-making effectiveness. The bottom part of the table compares the intercorrelation of predictor variables of coordination and control for the two school types.

Table 2 about here

In the ECE schools, the measures of coordination and control all have strong and statistically significant correlations with the Decision-Making Effectiveness Scale. The strength of these relationships supports the second prediction. The correlation of the two coordination measures are .469

($p < .053$) for the Ad Hoc Committee Index and .571 ($p < .021$) for the average value of Teacher Report on Policies in a school. The correlation between the Principal Supervision Scale and Decision-Making Effectiveness is .423 ($p < .075$); however, it is important to remember that there were no ECE principals receiving the highest score on the scale. The relationship observed comes from variation between the lower scores; the dimension runs from discussion with teachers to frequency of evaluation of the leading program (no ECE principal made frequent evaluation of reading teachers). Principal supportiveness strongly predicts Decision-Making Effectiveness for ECE schools: the correlation is .703 ($p < .004$). Here again, it is important to remember that ECE schools received (on the average) lower ratings from the faculty on this variable.

Turning to the non-ECE schools, there are only two strongly significant predictors of Decision-Making Effectiveness. One is the simple method of coordination, Teacher Report of Policies ($r = .550$; $p < .009$) and the other is the measure of climate leadership, Principal Supportiveness ($r = .486$; $p < .02$).

Clearly, sophisticated coordination and simple hierarchical control are more powerful predictors of decision-making effectiveness in ECE than in non-ECE schools. Putting this finding another way, failure of coordination and control of instruction is much more costly in ECE schools than in non-ECE schools. The relationship of policies to effective decision-making in both settings is not surprising given that policies are an excellent tool for making certain decisions "in advance." Their value, nevertheless, is not generally appreciated. Many schools have teachers reporting little use of policies.

Although Principal Supportiveness is a predictor of decision-making effectiveness in both settings, it is especially powerful in the ECE schools. Failure of the teachers to view the principal as supportive appears especially damaging to organizational effectiveness in the ECE school.

The bottom half of Table 2 shows stronger intercorrelations between the coordination and control variables for ECE schools than for non-ECE schools. The average correlation in ECE schools is .45, as compared to .15 in non-ECE schools, disregarding the sign of the coefficient. This suggests that coordination and control occur together as a group of strategies in the ECE school. The close relationship of the Ad Hoc Committee Index, the Policies Index and the Principal Supervision Scale, in particular, suggests that some ECE schools are responding to the complexities of their situation with all available strategies for increased coordination and control. Others may well be failing to respond, leaving them open to a series of difficulties in dealing with internal and external problems that require decisions.

Test of R-Square Increment

* Simple examination of correlations shows Principal Supportiveness as a significant predictor of Decision-Making Effectiveness in both sets of schools. This scale resembles the concept of climate leadership advocated in contemporary advice to principals. It would be useful to know if the other measures of coordination and control increase the effectiveness of decision-making, over and above the variable of Principal Supportiveness.

Because the formal coordination and control measures are so highly inter-correlated, we cannot assess their individual effects in a regression equation. Due to multicollinearity, some variables "absorb" the explanatory effect of others. Therefore in a regression analysis we consider the formal coordination

and control measures as a whole and examine their effects on the school's score on Decision-Making Effectiveness, as compared to the effects of the Principal Supportiveness Scale alone. In order to make this comparison, we have used a formula presented by Jacob Cohen, to test the significance of the increment in R-square when the formal coordination variables are added to the climate leadership variable.

Table 3 presents three regression equations for ECE schools and three identical regression equations for non-ECE schools.

Table 3 about here

Looking first at ECE schools, the R-square for the equation with coordination and Principal Supervision measures alone is .400. The Principal Supportiveness Scale alone in the second equation yields an R-square of .494. Putting them all together in the third equation brings the R-square to .817. Using the formula for the test of significance presented by J. Cohen, we find that F is 4.69, with $p < .05$. This means that the addition of the formal coordination and control measures to the climate leadership measure significantly increases the explained variance in the assessment of Decision-Making Effectiveness.

For the non-ECE schools, the first equation with the coordination and Principal Supervision measures shows an R-square of .307. Principal Supportiveness alone has an R-square of .236 in the second equation. The third equation brings the R-square to .537. The test of R-square increment shows an F-value of 2.817, $p < .10$. The pattern, similar to that of ECE schools is less strong and the improvement in the R-square with the addition of coordination and control measures is not statistically significant.

The results of this analysis are consistent with those suggested by the examination of simple correlations. Failure to use coordination and control

strategies in the ECE schools is more "costly" in terms of decision-making effectiveness than in non-ECE schools. Climate leadership may well be a necessary but not a sufficient strategy to maximize decision-making effectiveness when a school is faced with such task uncertainty and environmental constraint.

SUMMARY AND CONCLUSIONS

The two predictions derived from the organizational literature and from an analysis of the ECE school situation, were supported by the data. ECE schools show more coordination requiring horizontal communication and mutual adjustment. Furthermore, failure to employ strategies of coordination and control predicts failure in the decision-making process (as judged by teachers) much more markedly for ECE schools.

In one sense, the results suggest that schools are like other organizations when faced with increased task uncertainty and increased pressure for accountability; more sophisticated coordination becomes essential.

However, the results suggest that in other respects schools facing increased pressure for accountability are not like other organizations. ECE principals do not evaluate their reading teachers more frequently than other principals; 7 out of 13 do not do more than "discuss" work with teachers. Although simple hierarchical control through the processes of evaluation is supposed to be the major way organizations accomplish their goals, ECE principals typically do not use these methods of obtaining compliance, even when they are accountable to outside inspectors for performance.

This could mean that the weakness of formal sanctions of the principal requires alternative ways to achieve the compliance necessary for a success-

ful ECE program. He or she might use other kinds of sanctions, which are formal organizational sanctions, but which we have not measured. Alternatively, the strong correlations of the Principal Supportiveness Scale to effective decision-making in the ECE schools, suggests that principals may obtain compliance through an exchange process. The Principal Supportiveness Scale includes the provision of resources, praise, and personal instructional support. Similarly, the lower end of the Principal Supervision Scale contains items on discussion and advice between principal and teacher. (We are indebted to Joan Talbert for this interpretation). It is possible that the successful ECE principal offers rewards, resources and supportive supervision to the teachers in exchange for compliance and acceptance of joint responsibility for the outcomes of the ECE program.

If ECE is a model of future pressures for accountability in instruction, what can we conclude from study of these data? From a practical point of view, we have seen marked variability in the decision-making effectiveness of ECE schools. We would propose that those schools where the principal cannot manage the decision-making process also fail to implement their instructional programs; this is an empirical question which should be answered. It looks as if there are a number of ECE principals floundering about without the knowledge of coordination strategies and the kinds of supervision necessary to solve the problems of new educational technology. The teachers do not see these principals as supportive of their efforts.

One can be most sympathetic with these principals; the administration literature urges them to be a "climate leader." As we have measured the concept of climate leadership, it does indeed have a critical relationship to decision-making effectiveness in the ECE school. However, it is not

sufficient to manage decision-making without coordination and some other kinds of supervision of instruction and evaluations of programs. The principal needs to know just what "supportive supervision of instruction" entails if it does not mean evaluation of teachers. The principal also needs to know just how to obtain compliance if conventional organizational sanctions are weak.

Our analysis of the organizational literature leads to the conclusion that it is more helpful in understanding the necessity for coordination than in understanding problems of compliance and supervision. The propositions in the literature are not sufficiently conditionalized; there is no theoretical basis for deciding whether or not an organization with so little hierarchical control over its production process is similar to other organizational conditions. If it is not, then we should not expect many of the "truisms" from organizational theory to apply.

Although the special conditions faced by ECE schools do seem to make them better coordinated, the lack of evaluation even under conditions of increased accountability and inspection of outcomes confirms the suspicion that schools are fundamentally "different" kinds of organizations. Legislators and State Departments of Education assume that building-in accountability requirements will at last force schools to "tighten up." Teachers will be forced to produce desired outcomes; and schools will be properly "run" by the principal. This does not appear to be the case. Instead, we see the principals struggling in a threatening and uncertain situation to develop some kind of an alternative managerial style. We suspect that many are failing at this difficult task.

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Footnotes

1. We have some confidence that ECE schools were truly distinctive in their use of multiple materials and student grouping. Deal, et al. evaluated instruction in a set of ECE schools falling into a large random sample in the San Francisco Bay Area. Analysis of principal and teacher reports showed more highly differentiated technology in these schools than in other schools in the sample--particularly in the teaching of reading (Deal, et al., 1976). A state funded evaluation of ECE in 1975 also found that these schools were exhibiting desired program characteristics (Baker, 1976). A more recent evaluation shows favorable effects on ECE on achievement in schools with lower socioeconomic student bodies (Baker, 1978).

TABLE 1

Cross-Tabulations of Coordination and Control Measures:
ECE and Non-ECE Schools

A.

Principal Supervision Scale Scores: Principal Report

	1	2	Score 3	4	5	
	None of the Activities	-Discusses	-Discusses -Advises	-Discusses -Advises -Evaluates	-Discusses -Advises -Evaluates Reading Prog. -Evaluates Reading Tchrs.	
Non-ECE Schools	3 17%	6 33%	4 22%	2 11%	3 17%	Sum 18 100%
ECE Schools	2 15%	5 39%	3 23%	3 23%	0	13 100%

B.

Ad Hoc Committee Index: Principal Report

	<u>Low Use*</u>	<u>High Use*</u>	N
Non-ECE Schools	9 50%	9 50%	18 100%
ECE Schools	4 32%	9 68%	13 100%

* Low Use: Average use of Ad Hoc Committees tends to be "Occasional," "Rare," or "Never."

High Use: Average use of Ad Hoc Committees tends to be "Frequent" or "Very Frequent." See Appendix for details.

TABLE 1 CONTINUED

Cross-Tabulations of Coordination and Control Measures:
ECE and Non-ECE Schools

C.

Teacher Report of Policies: School Mean****

	<u>Score Range**</u>			N
	1.0 - 1.99	2.0 - 2.25	2.26 - 3.0	
Non-ECE Schools	3 17%	9 50%	6 33%	18 100%
ECE Schools	2 16%	4 30%	7 54%	13 100%

** 1 = Lowest Value--no explicit policies;
3 = Highest Value; see appendix.

D.

Teacher Report of Principal Supportiveness: School Mean****

	<u>Score Range***</u>			N
	1.0 - 1.99	2.0 - 2.99	3.0 - 5.0	
Non-ECE Schools	1 6%	8 44%	9 50%	18 100%
ECE Schools	2 15%	7 54%	4 31%	13 100%

*** 1 = Least Closeness;
5 = Greatest Closeness.

**** The distributions of individual values and ANOVAS by Schools are presented in the appendix.

TABLE 2

Correlations of Measures of Coordination, Control
and Decision-Making Effectiveness for ECE and Non-ECE Schools

A.

Correlations of Predictor Variables with
Decision-Making Effectiveness School Means

	<u>ECE Schools</u>	<u>Non-ECE Schools</u>
Number of Ad Hoc Committees Used in the School	.469 ($p \leq .053$)	-.162 ($p \leq .260$)
Mean of Teachers' Reports of the Number of School Policies	.571 ($p \leq .021$)	.550 ($p \leq .009$)
Principal's Report of His or Her Closeness of Supervision	.423 ($p \leq .075$)	.112 ($p \leq .329$)
School Mean of Teachers' Reports: Principal Supportiveness	.703 ($p \leq .004$)	.486 ($p \leq .020$)

B.

Correlations of Predictor Variables

	<u>ECE Schools</u>	<u>Non-ECE Schools</u>
Number of Ad Hoc Committees with Number of Policies Mean	.533 ($p \leq .030$)	-.220 ($p \leq .190$)
Number of Ad Hoc Committees with Principal Supervision	.496 ($p \leq .042$)	.103 ($p \leq .341$)
Number of Ad Hoc Committees with Principal Supportiveness	.093 ($p \leq .381$)	-.383 ($p \leq .059$)
Mean of Policies with Principal Supervision	.323 ($p \leq .141$)	.129 ($p \leq .305$)
Mean of Policies with Principal Supportiveness	.309 ($p \leq .152$)	.088 ($p \leq .364$)
Principal Supervision with Principal Supportiveness	.002 ($p \leq .498$)	.338 ($p \leq .085$)

TABLE 3

Test of R-Square Increment:
Regression Equations with Theoretical, Control and All Variables
for ECE and Non-ECE Schools

ECE Schools Predicting Mean Decision-Making Effectiveness

Equation with:

Theoretical Variables

$R^2 = .400$

	B
Ad Hoc Committees	.130
Policies	1.359
Principal	
Supervision	.158
(Constant)	-.788

Control Variables

$R^2 = .494$

	B
Principal	
Support	.770
(Constant)	1.114

All Variables

$R^2 = .817$

	B
Ad Hoc Comm.	.395
Policies	.229
Principal	
Supervision	.145
Principal	
Support	.786
(Constant)	-1.176

TEST OF INCREMENT: R-Square: Control to All
Variable Equations:
F = 4.69 Significance: $p \leq .05$

Non-ECE Schools Predicting Mean Decision-Making Effectiveness

Equation with:

Theoretical Variables

$R^2 = .307$

	B
Ad Hoc Committees	-.05
Policies	1.96
Principal	
Supervision	.299
(Constant)	-.661

Control Variables

$R^2 = .236$

	B
Principal	
Support	.576
(Constant)	1.78

All Variables

$R^2 = .537$

	B
Ad Hoc Comm.	.198
Policies	2.08
Principal	
Supervision	-.108
Principal	
Support	.677
(Constant)	-3.39

TEST OF INCREMENT: R-Square: Control to All
Variable Equations:
F = 2.817 Significance: $p \leq .10$

Appendix A

Information on the Construction of Indices and Scales

1.

Principal's Report of the Use of Ad Hoc Committees:

Intercorrelation of Items and Index

Faculty Meetings: Problems Delegated to Committee	Ad Hoc Comm: Instructional Problems	Ad Hoc Comm: School-Commun. Problems	Ad Hoc Comm: Administrative Problems	Ad Hoc Index
1	2	3	4	5
1 ---	.56	.55	.45	.792
2	---	.69	.55	.851
3		---	.60	.858
4			---	.787

N = 102

Distribution of Scores on Ad Hoc Committees Index

Value Range*	Per Cent	N
1.0 - 1.49	2.9%	3
1.5 - 1.99	.98%	1
2.0 - 2.49	10.8%	11
2.5 - 2.99	14.7%	15
3.0 - 3.49	28.4%	29
3.5 - 3.99	21.6%	22
4.0 - 4.49	13.7%	14
4.5 - 5.00	6.9%	7
	100.0%	102

* 1 = Never Uses Ad Hoc Committees;

5 = Very Frequently Uses Ad Hoc Committees for
Each Area of Concern.

Appendix A

2.

Teachers' Reports of Number of School-Wide Policies:

Intercorrelation of Items and Index

Policies: Student Conduct 1	Policies: Report of Stu. Progress 2	Policies: Student Absences 3	Policies: Care of Needy Studnts. 4	Policies: Student Evaluation 5	Policies Index 6
1—	.30	.23	.09	.21	.557
2	—	.19	.22	.24	.608
3		—	.22	.27	.632
4			—	.28	.628
5				—	.646

N = 224

Distribution of Scores on Policies Index

<u>Value Range*</u>	<u>Per Cent</u>	<u>N</u>
1.00 - 1.24	.9%	2
1.25 - 1.49	1.8%	4
1.50 - 1.74	7.1%	16
1.75 - 1.99	9.8%	22
2.00 - 2.24	38.4%	86
2.25 - 2.49	18.8%	42
2.50 - 2.74	10.7%	24
2.75 - 3.00	12.5%	28
	<u>100.0%</u>	<u>224</u>

* The value range runs from (1) No Explicit Policies to (3) Explicit Policies in Each Area.

School Mean Values were created after an Analysis of Variance showed these values for School Effects and Teachers' Reports of Policies:

D. F.: 30, 193

F = 2.736

Significance: $p \leq .001$

Appendix A

3.
Principal's Report of Supervision: A Guttman Scale

Items and Passing Responses

Frequency Principal Discusses Teacher's Work with Teacher

Passing Responses: Daily, Several Times a Week, Once a Week, 1 or 2 Times a Month Percent Passing: 78.3%

Frequency Principal Advises Regarding Teaching

Passing Responses: Very Frequently, Frequently, Fairly Often Percent Passing: 47.9%

Frequency Principal Evaluates Reading Program

Passing Responses: Three or More Times a Year, Daily or Continually Percent Passing: 39.2%

Frequency Principal Evaluates the Reading Teachers

Passing Responses: Very Frequently, Frequently Percent Passing: 21.7%

Reproducibility Coefficient: .92

Scalability Coefficient: .75

Distribution of Scores on Principal Supervision Scale

<u>Scale Score</u>	<u>Per Cent</u>	<u>N</u>
1. Fails All Items	19.1%	17
2. Passes First Item Only	20.2%	18
3. Passes First and Second Items Only	34.8%	31
4. Passes First, Second and Third Items	11.2%	10
5. Passes All Items	14.6%	13
	100.0%	89

Appendix A

4.

Teachers' Reports of Principal Support: A Guttman Scale

Items and Passing Responses

Frequency the Principal Praises the Teacher's Work

Passing Responses: Very Frequently, Frequently,
Fairly Often, Occasionally

Percent Passing: 73.7%

Frequency of Helpful Advice from the Principal

Passing Responses: Very Frequently, Frequently,
Fairly Often, Occasionally

Percent Passing: 57.6%

Frequency of Principal's Providing Resources

Passing Responses: Very Frequently, Frequently,
Fairly Often

Percent Passing: 37.3%

Actual Principal Role -- Working with Teachers

Passing Responses: A Great Deal, Considerable
Amount, Moderate Amount

Percent Passing: 20.5%

Reproducibility Coefficient: .95

N = 438

Scalability Coefficient: .80

Distribution of Scores on Principal Support Scale

<u>Scale Score</u>	<u>Per Cent</u>	<u>N</u>
1. Fails All Items	18.5%	81
2. Passes First Item Only	23.3%	102
3. Passes First and Second Items Only	27.4%	120
4. Passes First, Second and Third Items	17.8%	78
5. Passes All Items	13.0%	57
	100.0%	438

School mean values were created after an Analysis of Variance showed these values for School Effects and Teachers' Reports of Principal Support:

D. F.: 46, 391

F = 2.61

Significance: $p < .001$

Appendix A

5.
Teachers' Reports of Decision-Making Effectiveness
At Their Schools: A Guttman Scale

Items and Passing Responses

Decision-Making: The problems are clearly defined.

Passing Responses: Always, Usually, Fairly Often

Percent Passing: 80.3%

Decision-Making: The alternatives are clear.

Passing Responses: Always, Usually, Fairly Often

Percent Passing: 73.6%

Decision-Making: There is an implementation of decisions.

Passing Responses: Always, Usually

Percent Passing: 57.5%

Decision-Making: There is an evaluation of effectiveness.

Passing Responses: Always, Usually

Percent Passing: 28.2%

Reproducibility Coefficient: .94

N = 225

Scalability Coefficient: .75

Distribution of Scores on Decision-Making Effectiveness Scale

Scale Score	Per Cent	N
1. Fails All Items	17.3%	39
2. Passes First Item Only	5.3%	12
3. Passes First and Second Items Only	20.4%	46
4. Passes First, Second and Third Items	29.3%	66
5. Passes All Items	27.6%	62
	100.0%	225

School mean values were created after an Analysis of Variance showed these values for School Effects and Teachers' Reports of Decision-Making Effectiveness:

D. F.: 30, 194

F = 1.93

Significance: $p < .01$

Appendix B

Distributions of Scores for Indices and Scales:
31 Schools in Analysis

1.

Schools Funded and Not Funded by ECE

	n	%
Not Funded by ECE	18	58.1
Funded by ECE	13	41.9
	31	100.0

2.

Index of Number of Ad Hoc Committees: Principal Report

<u>Value Range</u>	n	%
2.0 - 2.49	5	16.2
2.5 - 2.99	3	9.7
3.0 - 3.49	7	22.5
3.5 - 3.99	9	29.0
4.0 - 4.49	3	9.7
4.5 - 5.0	4	12.9
	31	100.0

3.

Teachers' Reports of the Number of School Policies:

Mean Values for Schools

<u>Value Range</u>	n	%
1.5 - 1.75	1	3
1.76 - 1.99	4	13
2.00 - 2.25	13	42
2.26 - 2.50	10	32
2.51 - 3.00	3	10
	31	100.0%

Appendix B

4.
Principal Supervision Scale

<u>Value</u>	<u>n</u>	<u>%</u>
1. Fails All Items	5	16.1
2. Passes First Item Only	11	35.5
3. Passes First, Second Items Only	7	22.6
4. Passes First, Second, Third Items	5	16.1
5. Passes All Items	3	9.7
	31	100.0%

5.
Principal Support Scale:
Mean Values of Teachers' Reports for the School

<u>Value Range</u>	<u>n</u>	<u>%</u>
1.0 - 1.49	1	3
1.5 - 1.75	0	0
1.76 - 1.99	2	6
2.00 - 2.25	3	10
2.26 - 2.49	4	13
2.50 - 2.75	4	13
2.76 - 2.99	4	13
3.00 - 3.25	7	23
3.26 - 3.49	0	0
3.50 - 3.75	1	3
3.76 - 3.99	2	6
4.00 - 5.00	3	10
	31	100.0

Appendix B

6.

Teachers' Reports of Decision-Making Effectiveness:
Distribution of Mean Values for Schools

<u>Value Range</u>	n	%
1.0 - 1.99	1	3.0
2.0 - 2.99	5	16.0
3.0 - 3.99	16	52.0
4.0 - 5.00	9	29.0
	31	100.0